(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
2 November 2000 (02.11.2000)

PCT

(10) International Publication Number
WO 00/65700 A3

(51) International Patent Classification[7]: H01S 5/40, 5/183, H01L 31/0232, 33/00

(21) International Application Number: PCT/US00/11048

(22) International Filing Date: 25 April 2000 (25.04.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/300,253 27 April 1999 (27.04.1999) US

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(81) Designated States *(national)*: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW.

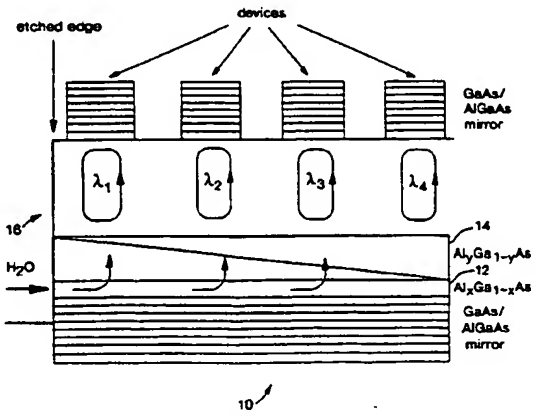
(84) Designated States *(regional)*: European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *With international search report.*

(88) Date of publication of the international search report:
18 January 2001

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: POSTGROWTH ADJUSTMENT OF CAVITY SPECTRUM FOR SEMICONDUCTOR LASERS AND DETECTORS



(57) Abstract: A method for selectively tuning the wavelength of optical cavities in semiconductor lasers and detectors after epitaxial growth using lateral wet oxidation. Tuning layers of $Al_xGa_{1-x}As$ and $Al_yGa_{1-y}As$ are positioned inside or adjacent to the optical cavity. Wet lateral oxidation is then used to transform the high-index semiconductor into a low-index oxide for tuning. The oxidation proceeds laterally into the $Al_xGa_{1-x}As$ and then attacks the $Al_yGa_{1-y}As$ layer vertically. The ratios of the oxidation rates can be controlled by adjusting the compositions of the materials, most notably because the oxidation rate increases as the amount of aluminum increases. The oxidized thickness depends on the time that the tuning layer is exposed to vertical oxidation. Due to the change in optical index from the semiconductor to the oxide, the optical thickness and the resonant wavelength of the cavity are also tailored along the lateral oxidation. As a result, the resonant wavelength of a device depends on its distance from the etched edge.

INTERNATIONAL SEARCH REPORT

Interr ıal Application No
PCT/US 00/11048

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01S5/40 H01S5/183 H01L31/0232 H01L33/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H01S H01L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, INSPEC, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FIORE A ET AL: "POSTGROWTH TUNING OF SEMICONDUCTOR VERTICAL CAVITIES FOR MULTIPLE-WAVELENGTH LASER ARRAYS" IEEE JOURNAL OF QUANTUM ELECTRONICS,IEEE INC. NEW YORK,US, vol. 35, no. 4, April 1999 (1999-04), pages 616-622, XP000850971 ISSN: 0018-9197	1-13, 16-24, 26-46
Y	the whole document	3,14
A		15,25

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[X] Further documents are listed in the continuation of box C. [ ] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
17 October 2000	03/11/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Claessen, L

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INTERNATIONAL SEARCH REPORT

Interr nal Application No
PCT/US 00/11048

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	WIPIEJEWSKI T ET AL: "VERTICAL-CAVITY SURFACE-EMITTING LASER DIODES WITH POST-GROWTH WAVELENGTH ADJUSTMENT" IEEE PHOTONICS TECHNOLOGY LETTERS,US,IEEE INC. NEW YORK, vol. 7, no. 7, 1 July 1995 (1995-07-01), pages 727-729, XP000516835 ISSN: 1041-1135	6,7,9, 26,43
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PCT/US 00/11048

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